Methandienone And Oxymetholone - Mass spectrometric description of novel oxymetholone and .

Metandienone, also known as methandienone or methandrostenolone and sold under the brand name Dianabol (D-Bol) among others, is an androgen and anabolic steroid (AAS) medication which is still quite often used because of its affordability and effectiveness for bulking cycles.

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Methandrostenolone vs Methandienone - What's the difference?

Methandienone, methandriol, and oxymetholone, which are anabolic steroids possessing 17alpha-methyl and 17beta-hydroxy groups, were developed as oral formulations for therapeutic purposes. However, they have been used in racehorses to enhance racing performance. In humans, it has been reported that structurally related anabolic steroids having the 17alpha-methyl and 17beta-hydroxy groups .

Anadrol vs Dianabol | Oxymetholone and Methandienone | IronDaddy

The androgenic effects are the enlargement of the larynx causing a deepening of the voice, the growth of terminal hair (in the pubic, axillary and facial regions; in other regions such growth depends on a number of factors), an increase in sebaceous gland activity (can lead to acne), and CNS effects (libido and increased aggression).

[PDF] Detection of urinary metabolites common to structurally related .

Journal of Analytical Toxicology, Vol. 32, June 2008

Short Communication

Detection of Urinary Metabolites Common to Structurally Related 17α-Alkyl Anabolic Steroids in Horses and Application to Doping Tests in Racehorses: Methandienone, Methandriol, and Oxymetholone

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Abstract

Methandienone, methandriol, and oxymetholone, which are anabolic steroids possessing 17α-methyl and 17β-hydroxy groups, were developed as oral formulations for therapeutic purposes. However, they have been used in racehorses to enhance racing performance. In humans, it has been reported that structurally related anabolic steroids having the 17α-methyl and 17β-hydroxy groups, including 17α-methyltestosterone, mestanolone, methandienone, methandriol, and oxymetholone, have metabolites in common. In this study, we found that metabolites common to those of 17α-methyltestosterone and mestanolone were detected in horse urine after the administration of oxymetholone, methandienone, and methandriol. Based on analytical data, we confirmed these to be the common metabolites of five structurally related steroids, 17α-methyltestosterone, mestanolone, oxymetholone, methandienone, and methandriol. Furthermore, we detected hitherto unknown urinary metabolites of methandriol and oxymetholone in horses. The parent steroid itself was detected in horse urine after the administration of methandriol, other than metabolites common to 17α-methyltestosterone and mestanolone. On the other hand, the major metabolite of oxymetholone was mestanolone, aside from metabolites presumed to be the stereoisomers of 2-hydroxymethyl-17α-methyl-5α-androstan-3,17β-diol and 2,17α-di(hydroxymethyl)-5α-androstan-3,17β-diol. The simultaneous detection of common metabolites and other main metabolites would help us narrow down the candidate-administered steroid for the doping tests in racehorses.

Introduction

Anabolic steroids have been developed primarily for therapeutic purposes; however, they have been illegally used to improve physical performance in human sports and horseracing. Accordingly, their use is now forbidden in athletes and racehorses, and doping test laboratories have been requested to develop methods for the detection of possibly misused anabolic steroids. We previously reported the urinary metabolites of 17α-methyltestosterone (MTS) and mestanolone (MSL), two compounds having very similar chemical structures, and established doping tests for racehorses (1). As a result, we confirmed that 17α-methyl-5α-androstan-3β,17β-diol (I), 17α-hydroxymethyl-5α-androstan-3β,17β-diol (II), 17α-methyl-5α-androstan-3β,16α,17β-triol (III), and 17α-methyl-5α-androstan-3β,16β,17β-triol (IV) were mainly excreted as common metabolites in horse urine after the administration of MTS and MSL. 17α-Methyl-5β-androstan-3α,16β,17β-triol (V), one of the major metabolites of MTS, was not detected in horse urine after the administration of MSL. Furthermore, quantification of these metabolites in horse urine samples after administration revealed that IV had the highest concentration and was detected for the longest time, compared with the other metabolites. Therefore, IV may be a very useful screening target for MTS and MSL in the doping tests for racehorses. However, some human metabolism studies have indicated that structurally related anabolic steroids with 17α-methyl and 17β-hydroxy groups; namely, methandienone (MDI), methandriol (MDO), and oxymetholone (OXM) yielded metabolites common to those of MTS and MSL (2,3). For this reason, when those main metabolites are detected in doping tests of MTS and MSL in racehorses, the suspect administered drug should include not only MTS and MSL but also MDI, MDO, and OXM. It is stipulated in Japanese regulations for the doping tests in racehorses that when metabolites are detected in urine or plasma, the administered drug should be specified. Therefore, knowledge of metabolites common to different drugs would be useful for the doping tests in racehorses. Regarding MDI, urinary metabolites common to those of MTS and MSL were suggested in a previous report (4). However, as far as we know, there are no detailed reports of the metabolism of MDO in horses, and it is not known whether findings in human experiments apply to horse. Our objective was to compare the metabolism of MDI, MDO, and OXM with that of MTS

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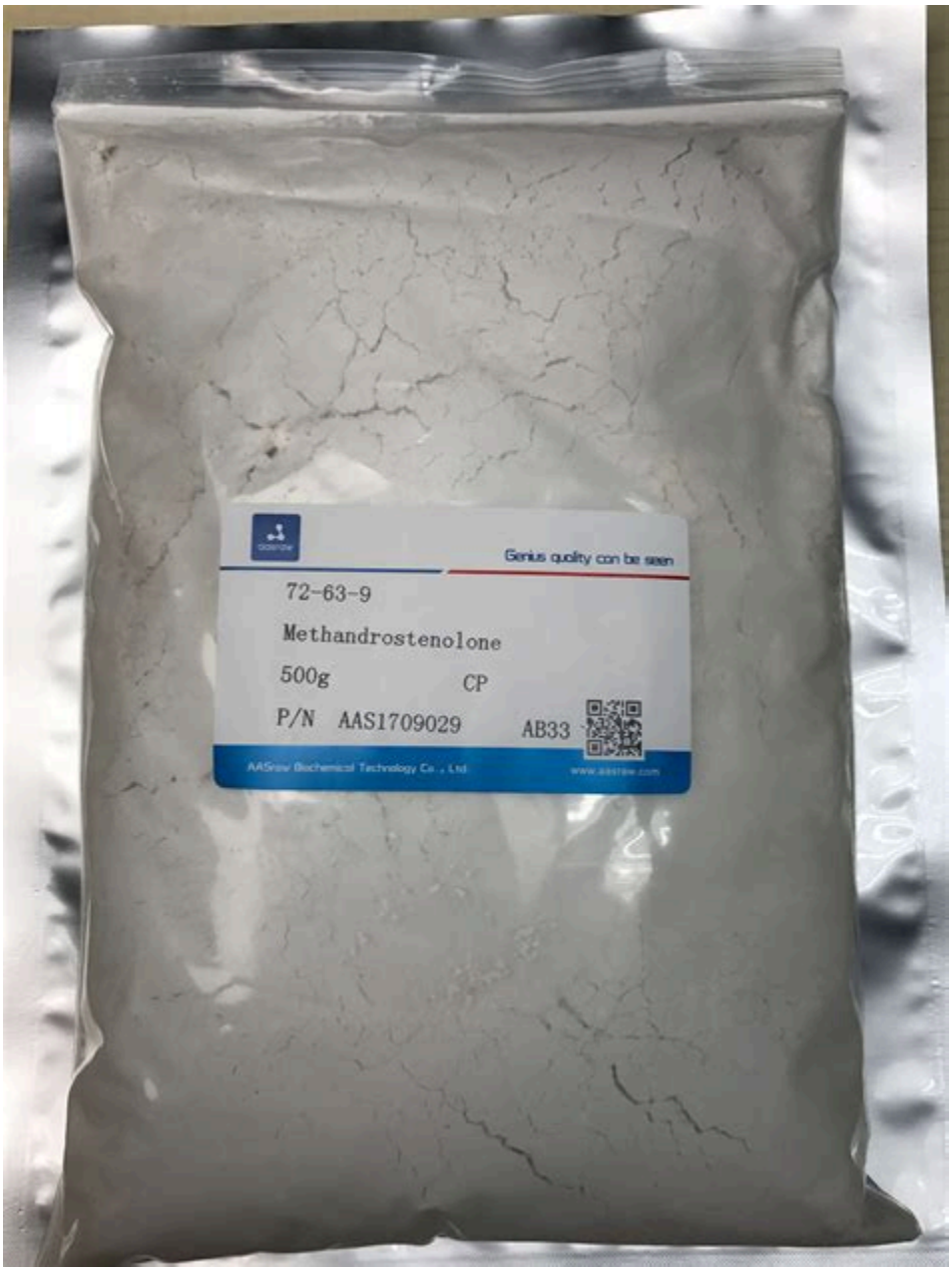
It's important to mention that since Anadrol (Oxymetholone) is a more powerful steroid, it will generally produce slightly better results in comparison to Dianabol (Methandienone). But remember that this comes with the drawback of Adrol also causing more severe side effects than Dbol.

The Best Steroid Stacks | JuicedMuscle. com

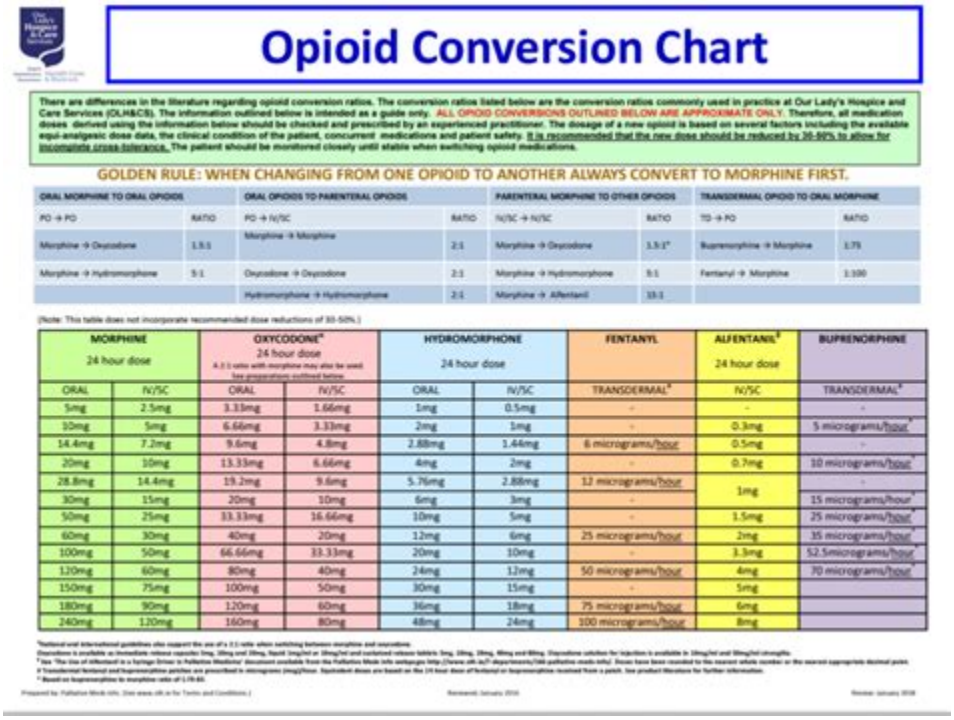
Methandienone oxymetholone — anadrol is derived from dihydrotestosterone (dht) and has a short half life of 8 to 9 hours so is a daily dosed steroid available in oral. Is not ideal for giving steroids with short half-lives (such as anadrol). — anadrol is one of the most usable steroid in both medical use and bodybuilding but we are not .

Methandrostenolone | C20H28O2 | CID 6300 - PubChem



Semantic Scholar extracted view of "Detection of methandienone (methandrostenolone) and metabolites in horse urine by gas chromatography-mass spectrometry. " . Methandienone, methandriol, and oxymetholone, which are anabolic steroids possessing 17alpha-methyl and 17beta-hydroxy groups, were developed as oral formulations for therapeutic purposes.

Methadone vs Oxycodone Comparison - Drugs. com



Opioid Conversion Chart

There are differences in the literature regarding opioid conversion ratios. The conversion ratios listed below are the conversion ratios commonly used in practice at Our Lady's Hospice and Care Services (OLH&CS). The information outlined below is intended as a guide only. ALL OPIOID CONVERSIONS OUTLINED BELOW ARE APPROXIMATE ONLY. Therefore, all medication doses derived using the information below should be checked and prescribed by an experienced practitioner. The dosage of a new opioid is based on several factors including the available equi-analgesic dose data, the clinical condition of the patient, concurrent medications and patient safety. It is recommended that the new dose should be reduced by 30-50% to allow for incomplete cross-tolerance. The patient should be monitored closely until stable when switching opioid medications.

GOLDEN RULE: WHEN CHANGING FROM ONE OPIOID TO ANOTHER ALWAYS CONVERT TO MORPHINE FIRST.

ORAL MORPHINE TO ORAL OPIOIDS		ORAL OPIOIDS TO PARENTERAL OPIOIDS		PARENTERAL MORPHINE TO OTHER OPIOIDS		TRANSDERMAL OPIOID TO ORAL MORPHINE	
PO → PO	RATIO	PO → IV/SC	RATIO	IV/SC → IV/SC	RATIO	TD → PO	RATIO
Morphine → Oxycodone	1.5:1	Morphine → Morphine	2:1	Morphine → Oxycodone	1.5:1*	Buprenorphine → Morphine	1:75
Morphine → Hydromorphone	5:1	Oxycodone → Oxycodone	2:1	Morphine → Hydromorphone	5:1	Fentanyl → Morphine	1:100
		Hydromorphone → Hydromorphone	2:1	Morphine → Alfentanil	33:1		

(Note: This table does not incorporate recommended dose reductions of 30-50%.)

MORPHINE 24 hour dose		OXYCODONE* 24 hour dose A 2:1 ratio with morphine may also be used. See preparations outlined below.		HYDROMORPHONE 24 hour dose		FENTANYL	ALFENTANIL† 24 hour dose	BUPRENORPHINE
ORAL	IV/SC	ORAL	IV/SC	ORAL	IV/SC	TRANSDERMAL#	IV/SC	TRANSDERMAL#
5mg	2.5mg	3.33mg	1.66mg	1mg	0.5mg	-	-	-
10mg	5mg	6.66mg	3.33mg	2mg	1mg	-	0.3mg	5 micrograms/hour
14.4mg	7.2mg	9.6mg	4.8mg	2.88mg	1.44mg	6 micrograms/hour	0.5mg	-
20mg	10mg	13.33mg	6.66mg	4mg	2mg	-	0.7mg	10 micrograms/hour
28.8mg	14.4mg	19.2mg	9.6mg	5.76mg	2.88mg	12 micrograms/hour	1mg	-
30mg	15mg	20mg	10mg	6mg	3mg	-		15 micrograms/hour
50mg	25mg	33.33mg	16.66mg	10mg	5mg	-	1.5mg	25 micrograms/hour
60mg	30mg	40mg	20mg	12mg	6mg	25 micrograms/hour	2mg	35 micrograms/hour
100mg	50mg	66.66mg	33.33mg	20mg	10mg	-	3.3mg	52.5micrograms/hour
120mg	60mg	80mg	40mg	24mg	12mg	50 micrograms/hour	4mg	70 micrograms/hour
150mg	75mg	100mg	50mg	30mg	15mg	-	5mg	
180mg	90mg	120mg	60mg	36mg	18mg	75 micrograms/hour	6mg	
240mg	120mg	160mg	80mg	48mg	24mg	100 micrograms/hour	8mg	

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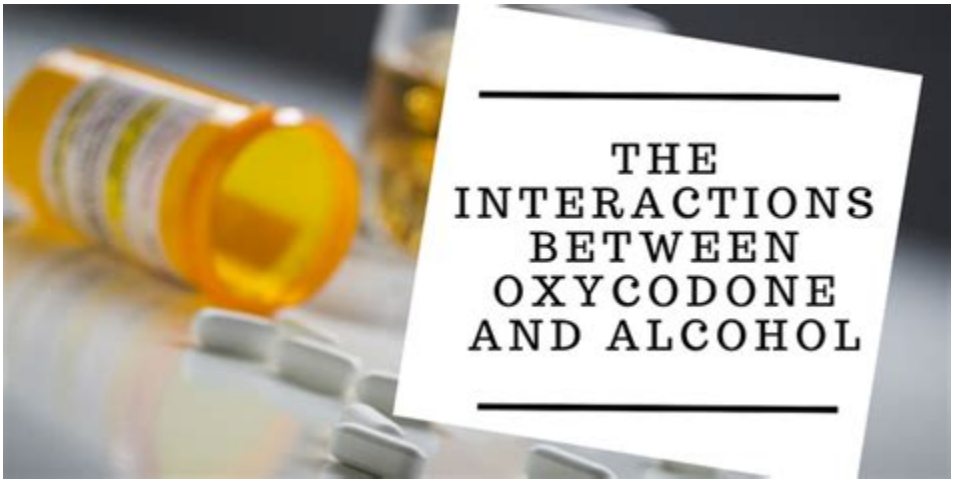
Methadone and oxycodone Interactions - Drugs. com



Methandrostenolone is an organic molecular entity. ChEBI Metandienone is an orally active anabolic androgenic steroid. It was introduced to the market in the 1960s but later discontinued and withdrawn from the market.

Metandienone - Wikipedia

Two major unconjugated acidic metabolites of oxymetholone (17β-hydroxy-2-hydroxymethylene-17α-methyl-5α-androstan-3-one,1), namely, 17β-hydroxy-17α-methyl-2,3-seco-5α. -androstane-2,3-dioic acid (2) and 3α,17β-dihydroxy-17α-methyl-5α-androstane-2β-carboxylic acid (6a), were detected by gas chromatographylmass spectrometry in urine samples colle.

Effects of methandienone on the performance and body . - PubMed

Methandienone, methandriol, and oxymetholone, which are anabolic steroids possessing 17alpha-methyl and 17beta-hydroxy groups, were developed as oral formulations for therapeutic purposes.

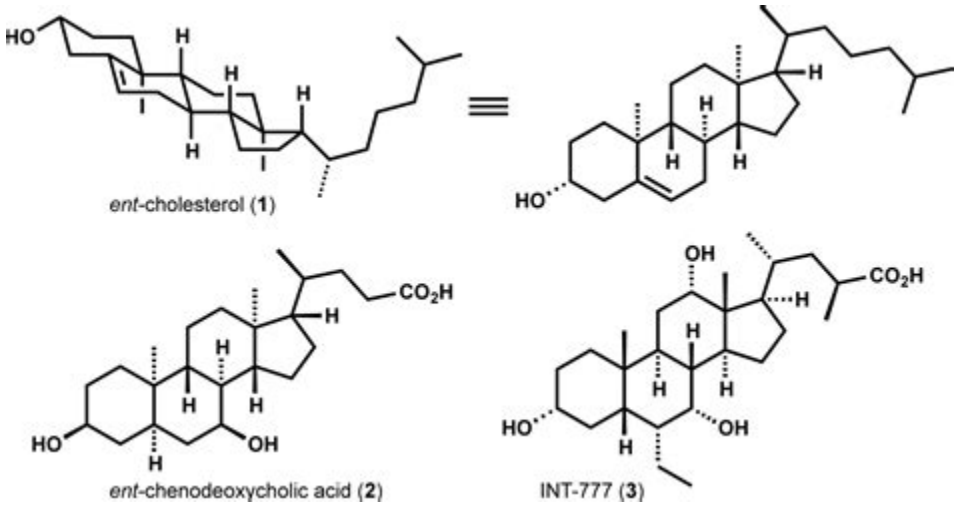
Studies on anabolic steroids: V. Sequential reduction of methandienone .

1. In a previous study of the effects of methandienone (Dianabol) on men undergoing athletic training, strength and performance increased, but not significantly more when the subjects were taking the drug than when they were taking placebo.

Anadrol (Oxymetholone): The Ultimate Guide - Inside Bodybuilding

RESULTS AND DISCUSSION Mestanolone and oxymetholone Reconstructed ion chromatograms illustrating typical urinary profiles of the tetrahydro metabolites resulting from the stereoselective reduction of the J4_ and/or 3-oxo functions of mestanolone, methandienone, 17oc-MT and oxymetholone are shown in Fig. 1.

Studies on anabolic steroids. 10. Synthesis and . - ScienceDirect



Medical uses The primary clinical applications of oxymetholone include treatment of anemia and osteoporosis, as well as stimulating muscle growth in malnourished or underdeveloped patients. [4] However, in the United States, the only remaining FDA -approved indication is the treatment of anemia. [4] [12]

Oxymetholone - Wikipedia

About 20 metabolites were found for desoxymethyltestosterone and more than 40 for oxymetholone, with many of them being isomeric compounds. In addition to the well-known reduced and hydroxylated metabolites, 18-nor-17,17-dimethyl and 18-nor-17-hydroxymethyl-17-methyl steroids were also identified. Having evaluated all the metabolites in terms .

(PDF) Detection of Urinary Metabolites Common to . - ResearchGate

Research article

Drug Testing and Analysis

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(www.drugtestinganalysis.com) DOI 10.1002/dta.1431

Detection and characterization of urinary metabolites of boldione by LC-MS/MS. Part II: Conjugates with cysteine and *N*-acetylcysteine

Oscar J. Pozo,[a]* Cristina Gómez,[a,b] Josep Marcos,[a,b] Jordi Segura[a,b] and Rosa Ventura[a,b]

The occurrence of boldione metabolites conjugated with cysteine and *N*-acetylcysteine in human urine was evaluated. Methods based on precursor ion scan of the protonated aminoacid (*m/z* 122 and *m/z* 164 for cysteine and *N*-acetylcysteine respectively) and neutral losses of the aminoacids (121 Da and 163 Da for cysteine and *N*-acetylcysteine respectively) were applied for the open detection of conjugates. Results for urine samples collected before and after boldione administration were compared. Using this approach, 24 metabolites (eleven conjugates with cysteine and thirteen conjugated with *N*-acetylcysteine) were detected. The metabolites were characterized by mass spectrometry and their potential structures were proposed based on this information. The structures of nine of these metabolites were confirmed by the synthesis of the conjugates. According to these results, a metabolic pathway for boldione involving this type of conjugation was presented. Up to our knowledge this is the first time that cysteine conjugates are presented for exogenous anabolic androgenic steroids and the first report of *N*-acetylcysteine conjugates for steroids. Copyright © 2012 John Wiley & Sons, Ltd.

Keywords: boldione; anabolic agents; metabolism; cysteine; *N*-acetylcysteine

Introduction

Anabolic androgenic steroids (AAS) are extensively metabolized[1–3] and studies on the metabolism are needed to elucidate the best markers for the detection of their misuse in sports. The best marker for the detection of a doping agent is not always the most abundant metabolite, but the metabolite excreted for the longest time after administration (so-called long-term metabolites) which offers the highest retrospectivity of the detection.[4]

Most of the metabolites used as markers of AAS misuse in the currently applied procedures in most anti-doping control laboratories have been identified using gas chromatography coupled to mass spectrometry (GC-MS).[5–7] However, GC-MS has some limitations for metabolic studies, being the need of derivatization of polar compounds and the need of hydrolysis of phase II metabolites the most important ones.

The occurrence of liquid chromatography coupled to tandem mass spectrometry (LC-MS/MS) technology opened several alternatives for metabolic studies such as the use of precursor ion or neutral loss scan methods,[5–8] the greater sensitivity for some metabolites depending on the structure[9–11] and the possibility of the direct detection of phase II metabolites without a previous hydrolysis.[11–13]

Most important phase II metabolic reactions for AAS consist of conjugation with glucuronic or sulfuric acid.[1–3] Phase II metabolism is commonly studied using hydrolysis of the conjugates to phase I metabolites and identification of these phase I metabolites by GC-MS and/or LC-MS/MS. Hydrolysis with enzymes with β-glucuronidase activity has been mainly used for the study of metabolites conjugated with glucuronic acid,[3–5,14–16] whereas chemical hydrolysis is the most effective procedure to hydrolyze metabolites conjugated as sulfate.[16–19]

Recently, a new phase II metabolic pathway was reported for steroid hormones.[20] Cysteine (Cys) conjugates were found in human urine after testosterone administration. The occurrence of these metabolites was associated with the presence of an unreported three-steps metabolic biotransformation: 6,7-dehydrogenation as phase I metabolism followed by conjugation with glutathione and subsequent transformation in Cys conjugates. It was proven that both Cys and *N*-acetylcysteine (NAC) conjugates generated the polyunsaturated steroid after alkaline treatment. Therefore, they are behind the occurrence of recently reported testosterone metabolites appearing in urine after alkaline treatment.[21] The indirect detection of these metabolites has been found to be useful for the anti-doping control field since they can improve the detection of endogenous steroid misuse in some scenarios.[22,23]

Boldione (1,4-androstadien-3,17-dione) is a prohormone marketed as precursor of boldenone. During the last years, boldione metabolism was studied either by GC-MS and LC-MS/MS.[3,15,16] Recent studies on boldione metabolism in humans performed by our group[24] have shown that concentrations of some boldione metabolites increased after alkaline treatment of the samples, indicating the existence of labile phase II conjugates. Boldione and several of its

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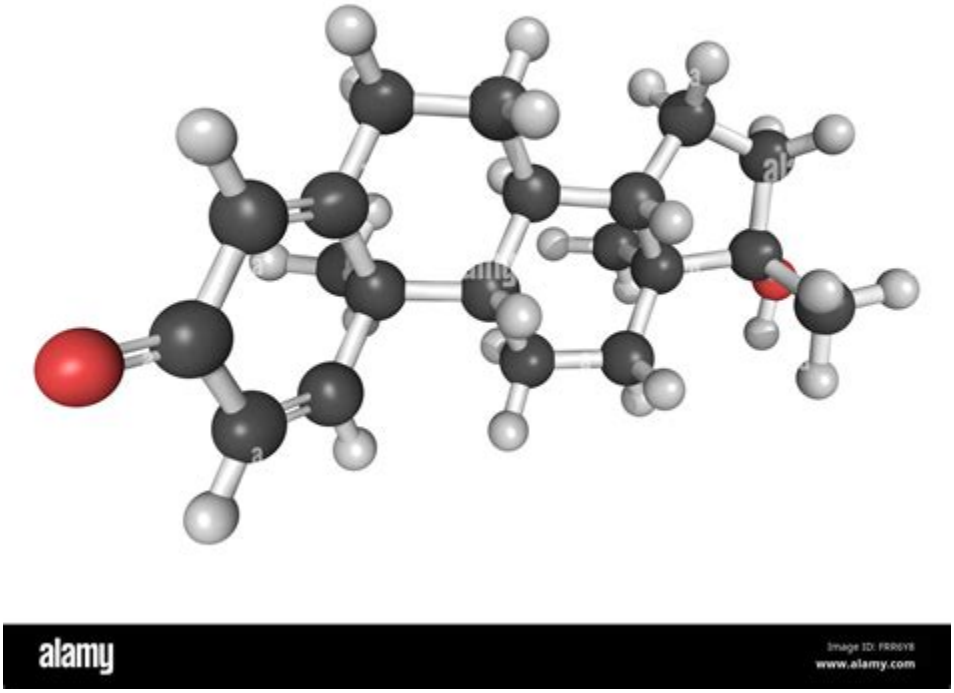
This may increase nervous system side effects such as drowsiness, dizziness, lightheadedness, difficulty concentrating, and impairment in thinking and judgment. In severe cases, low blood pressure, respiratory distress, fainting, coma, or even death may occur. You may also want to avoid or limit the consumption of grapefruit and grapefruit .

Metandienone - an overview | ScienceDirect Topics



Noun (-) methandrostenolone *{{quote-news, year=2008, date=June 28, author=Juliet Macur, title=11 Bulgarian Weight Lifters Are Dropped From Games, work=New York Times citation, passage=This time, the entire team tested positive for the steroid methandienone , the federation said.

Oxymetholone half-life, methandienone oxymetholone

2 Anadrol Benefits 2. 1 Rapid Weight Gain 2. 2 Muscle-Building 2. 3 Enhances Strength 2. 4 Oral Form 2. 5 Joint Support 2. 6 Fat Loss 3 Side Effects 3. 1 Liver toxicity 3. 2 High Blood Pressure 3. 3 Water Retention & Gynecomastia 3. 4 Shuts Down Testosterone 3. 5 Hair Loss & Acne 3. 6 Increased Risk of

Injury 3. 7 Decreased Well Being 4 Is Anadrol Safe?

Abstract - Oxford Academic

International Journal for Quality in Health Care 2015; pp. 439–446 10.1093/intqhc/mzu094

French Abstracts

The missing evidence: a systematic review of patients' experiences of adverse events in health care

La preuve manquante: Revue systématique des études de retour d'expérience des patients ayant subi un évènement indésirable associé aux soins

HARRISON REEMA, WALTON MERRILYN, MANIAS ELIZABETH, SMITH-MERRY JENNIFER, KELLY PATRICK, IEDEMA RICK, ROBINSON LAUREN

Int J Qual Health Care 27: 423–441

Objectif: Les dommages évitables liés à la survenue d'événements indésirables associés aux soins (EIAS) sont un des principaux problèmes des systèmes de santé des pays développés. La prise en compte de l'expérience des patients confrontés à la survenue d'EIAS est essentielle pour améliorer la qualité et la sécurité des soins. Une revue systématique des travaux concernant l'expérience des patients en cas d'EIAS a été menée afin de mieux connaître cette information, d'identifier les points posant problème et les défis à relever pour mieux exploiter le retour d'expérience des patients.

Origine des données: Une recherche systématique par mots clés, synonymes et titres de rubriques a été réalisée dans huit bases de données électroniques de janvier 2000 à février 2015Une recherche manuelle de références et de revues pertinentes a été de plus effectuée.

Sélection des travaux: Les titres et les résumés des publications ont été analysés par 2 lecteurs et vérifiés par un troisième. Les articles retenus ont alors été analysés dans leur intégralité.

Extraction des données: Les données concernant la conception des travaux, les méthodes utilisées et les principales conclusions ont été extraites et rassemblées.

Résultats: Trente trois publications ont montré que les patients peuvent identifier des problèmes concernant leurs soins. Les patients identifient le plus souvent des erreurs médicamenteuses, des problèmes de communication et de coordination dans leurs soins. Le niveau de revenu et d'éducation des patients, leur état de santé et leur statut matrimonial influencent la probabilité du signalement. Les patients signalent un état de détresse après la survenue d'un EIAS souvent majoré par un défaut d'information sur ses causes. L'étude du retour d'expérience des patients est difficile en raison du manque d'enquêtes impliquant un nombre suffisant de patients sur des périodes d'observation suffisantes et des incohérences dans la définition des EIAS.

Conclusions: Malgré l'apparition de nouvelles stratégies visant à améliorer la participation des patients, peu d'études rapportent l'expérience des patients en cas de survenue d'un EIAS. Ces données devraient être recueillies de manière plus systématique pour développer des politiques systémiques efficaces centrées sur le patient visant à diminuer la fréquence des EIAS et à améliorer leur prise en charge.

Population experiences of primary care in 11 Organization for Economic Cooperation and Development countries

Evaluation des soins de santé primaires dans 11 pays de l'Organisation de coopération et de développement économiques

MACINKO JAMES, GUANAIS FREDERICO C.

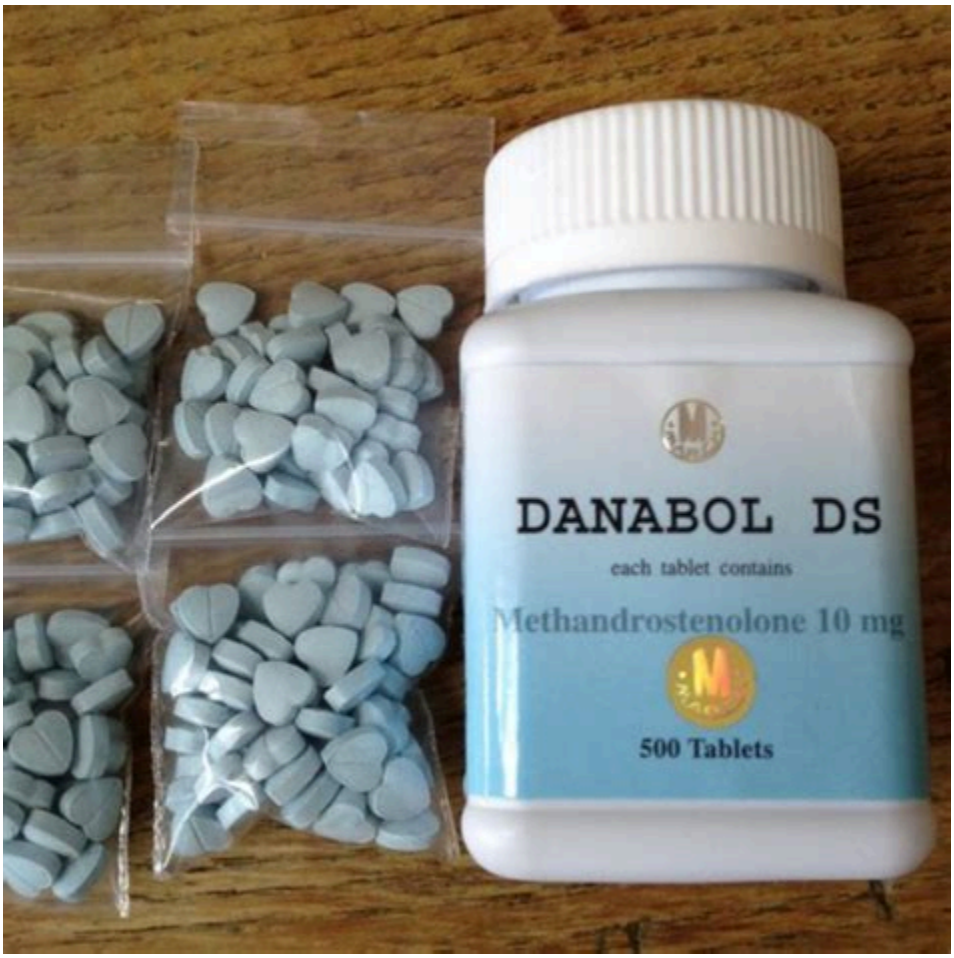
Int J Qual Health Care 27: 442–449

Objectif: Développer une mesure d'évaluation des soins primaires par les utilisateurs et tester la corrélation de cette évaluation avec la performance et la qualité du système de santé. Il s'agit d'une analyse transversale des données d'enquête recueillies en 2013 auprès de 20.045 patients en Australie, Canada, France, Allemagne, Pays-Bas, Nouvelle-Zélande, Norvège, Suède, Suisse, Royaume-Uni, États-Unis.

Principaux indicateurs de résultats: Couverture maladie (reste à charge>1000 dollars), l'accès aux soins (utilisation d'un service d' urgences hospitalières au cours des deux dernières années, consultation de trois médecins ou plus au cours de l'année précédente) et la prévention (mesure de la tension artérielle au cours de l' année précédente, contrôle de de la cholestérolémie au cours des cinq années précédentes, la prescription du vaccin antigrippal au cours l'année précédente, et déclaration d'erreurs médicales).

2. Trenbolone and Methandrostenolone (D-bol) Trenbolone again was in the range of 300-700 mg/week while the methandrostenolone dosage ranged from 105-350 mg/week. This particular stack was reported as being one of the most noticeable in terms of a "pump" or "feel effect. " 3. Trenbolone and Stanozolol (Winstrol)

Detection of methandienone (methandrostenolone) and metabolites in .



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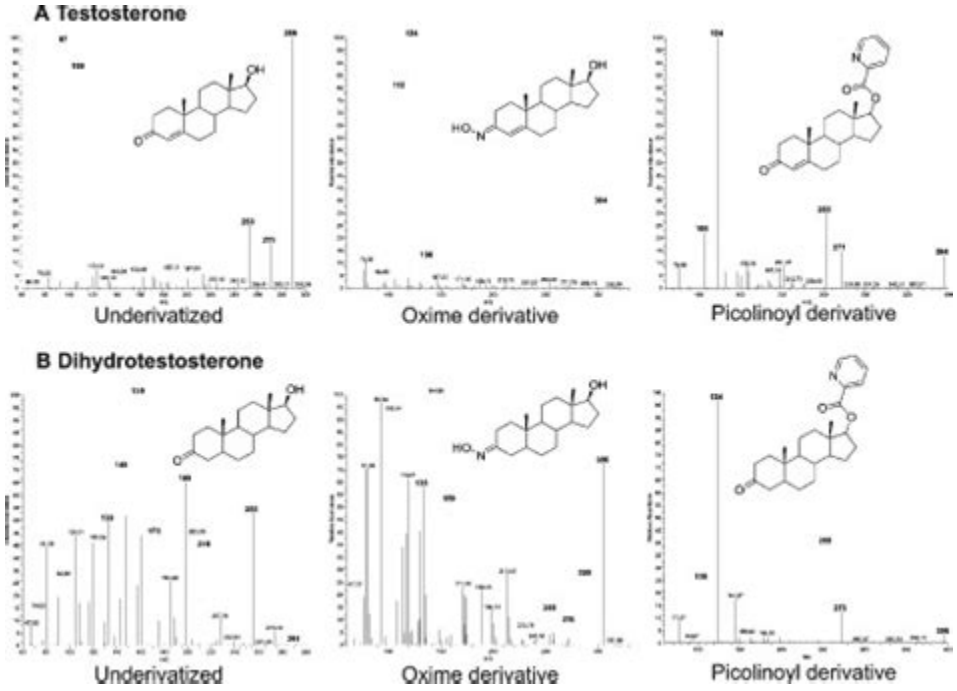
Studies on anabolic steroids—8. GC/MS . - Semantic Scholar



On the other hand, androgens such as testosterone decrease them; other anabolic steroids such as methandrostenolone and oxymetholone increase them slightly.

Detection of urinary metabolites common to structurally . - PubMed

Journal of Analytical Toxicology, Vol. 32, June 2008

Short Communication

Detection of Urinary Metabolites Common to Structurally Related 17α-Alkyl Anabolic Steroids in Horses and Application to Doping Tests in Racehorses: Methandienone, Methandriol, and Oxymetholone

Masayuki Yamada[1,*], Sugako Aramaki[1], Masahiko Kurosawa[1], Koichi Saito[2], and Hiroyuki Nakazawa[2]

[1]Laboratory of Racing Chemistry, 1731-2 Tsuruta-machi, Utsunomiya City, Tochigi, 320-0851, Japan and
[2]Department of Analytical Chemistry, Hoshi University, 2-4-41 Ebara, Tokyo 142-8501, Japan

Abstract

Methandienone, methandriol, and oxymetholone, which are anabolic steroids possessing 17α-methyl and 17β-hydroxy groups, were developed as oral formulations for therapeutic purposes. However, they have been used in racehorses to enhance racing performance. In humans, it has been reported that structurally related anabolic steroids having the 17α-methyl and 17β-hydroxy groups, including 17α-methyltestosterone, mestanolone, methandienone, methandriol, and oxymetholone, have metabolites in common. In this study, we found that metabolites common to those of 17α-methyltestosterone and mestanolone were detected in horse urine after the administration of oxymetholone, methandienone, and methandriol. Based on analytical data, we confirmed these to be the common metabolites of five structurally related steroids, 17α-methyltestosterone, mestanolone, oxymetholone, methandienone, and methandriol. Furthermore, we detected hitherto unknown urinary metabolites of methandriol and oxymetholone in horses. The parent steroid itself was detected in horse urine after the administration of methandriol, other than metabolites common to 17α-methyltestosterone and mestanolone. On the other hand, the major metabolite of oxymetholone was mestanolone, aside from metabolites presumed to be the stereoisomers of 2-hydroxymethyl-17α-methyl-5α-androstan-3,17β-diol and 2,17α-di(hydroxymethyl)-5α-androstan-3,17β-diol. The simultaneous detection of common metabolites and other main metabolites would help us narrow down the candidate-administered steroid for the doping tests in racehorses.

Introduction

Anabolic steroids have been developed primarily for therapeutic purposes; however, they have been illegally used to improve physical performance in human sports and horseracing. Accordingly, their use is now forbidden in athletes and racehorses, and doping test laboratories have been requested to develop methods for the detection of possibly misused anabolic steroids. We previously reported the urinary metabolites of 17α-methyltestosterone (MTS) and mestanolone (MSL), two compounds having very similar chemical structures, and established doping tests for racehorses (1). As a result, we confirmed that 17α-methyl-5α-androstan-3β,17β-diol (I), 17α-hydroxymethyl-5α-androstan-3β,17β-diol (II), 17α-methyl-5α-androstan-3β,16α,17β-triol (III), and 17α-methyl-5α-androstan-3β,16β,17β-triol (IV) were mainly excreted as common metabolites in horse urine after the administration of MTS and MSL. 17α-Methyl-5β-androstan-3α,16β,17β-triol (V), one of the major metabolites of MTS, was not detected in horse urine after the administration of MSL. Furthermore, quantification of these metabolites in horse urine samples after administration revealed that IV had the highest concentration and was detected for the longest time, compared with the other metabolites. Therefore, IV may be a very useful screening target for MTS and MSL in the doping tests for racehorses. However, some human metabolism studies have indicated that structurally related anabolic steroids with 17α-methyl and 17β-hydroxy groups; namely, methandienone (MDI), methandriol (MDO), and oxymetholone (OXM) yielded metabolites common to those of MTS and MSL (2,3). For this reason, when those main metabolites are detected in doping tests of MTS and MSL in racehorses, the suspect administered drug should include not only MTS and MSL but also MDI, MDO, and OXM. It is stipulated in Japanese regulations for the doping tests in racehorses that when metabolites are detected in urine or plasma, the administered drug should be specified. Therefore, knowledge of metabolites common to different drugs would be useful for the doping tests in racehorses. Regarding MDI, urinary metabolites common to those of MTS and MSL were suggested in a previous report (4). However, as far as we know, there are no detailed reports of the metabolism of MDO in horses, and it is not known whether findings in human experiments apply to horse. Our objective was to compare the metabolism of MDI, MDO, and OXM with that of MTS

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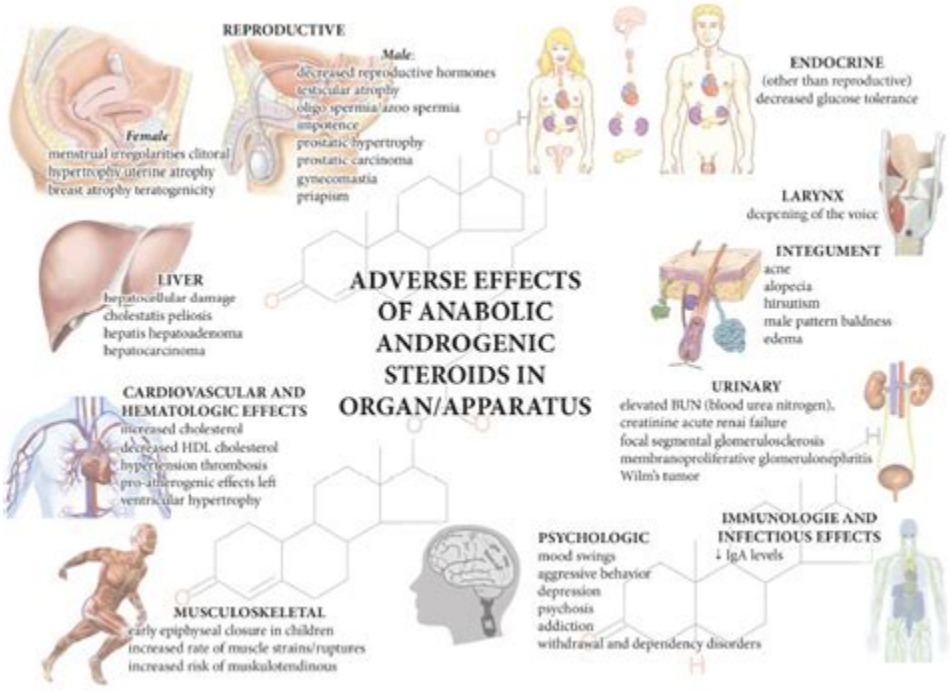

Methadone has an average rating of 8. 7 out of 10 from a total of 599 ratings on Drugs. com. 85% of reviewers reported a positive effect, while 5% reported a negative effect. Oxycodone has an average rating of 6. 9 out of 10 from a total of 1142 ratings on Drugs. com. 63% of reviewers reported a positive effect, while 25% reported a negative effect.

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